Appl. No. 10/613,514
Amdt. dated December 2, 2003
Preliminary Amendment

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of transmitting video information comprising:

(a) obtaining a first video frame containing image data;

(b) obtaining structural information inherent in ~~said~~ the image data;

(c) obtaining a second video frame to be encoded relative to said first video frame;

(d) computing kinetic information for describing ~~said~~ the second video frame in terms of ~~said~~ the structural information of ~~said~~ the first video frame; and

(e) transmitting said kinetic information to a decoder for use in reconstructing ~~said~~ the second video frame based on ~~said~~ the decoder's generation of ~~said~~ the structural information of ~~said~~ the first video frame.

2.-9. (Cancelled)

10. (New) A codec for encoding video information and decoding that video information, wherein the video information comprises at least a plurality of frames wherein each frame codes for an image of the video information, the codec comprising:

an encoder comprising:

a) an input to receive video information including at least a first frame and a second frame;

b) a segmenter that generates a segmentation of at least the first frame, wherein a segmentation represents an association of pixels of a frame with segments based on at least pixel values or image content;

c) a kinetic information generator that generates kinetic information that represents relative motion of segments between the first frame and the second frame, wherein relative motion relates to changes in position of segments between the first and second frames;

d) logic to encode the first frame to form a first encoded frame; and

Appl. No. 10/613,514
Amdt. dated December 2, 2003
Preliminary Amendment

PATENT

e) logic to encode the second frame to form a second encoded frame, wherein the second

encoded frame includes at least some of the kinetic information; and

a decoder comprising:

a) an input to receive the first encoded frame and the second encoded frame;

b) logic to decode the first encoded frame to form a first reconstructed frame;

c) a segmenter that generates a segmentation of at least the first reconstructed frame; and

d) logic to decode the second encoded frame to form a second reconstructed frame using at

least some of the segmentation generated by the segmenter of the decoder and using at

least some of the kinetic information encoded in the second encoded frame.

11. (New) The codec of claim 10, wherein the encoder's segmenter and the

decoder's segmenter are such that they generate the same segmentation for a given image frame.

12. (New) An encoder for encoding video information, wherein the video

information comprises at least a plurality of frames wherein each frame codes for an image of the

video information, the encoder comprising:

an input to receive video information including at least a first frame of the plurality of

frames and a second frame of the plurality of frames;

logic to encode the first frame to form a first encoded frame;

logic to determine a first reconstructed frame, wherein the first reconstructed frame is a

frame that would result from a decoding of the first encoded frame;

a segmenter that generates segmentation information about the first reconstructed frame,

wherein the segmentation information relates to segmenting the image of the first

reconstructed frame based on image content of the first frame;

a difference information generator that generates difference information between the first

and second frames, wherein the difference information relates segments of the first

reconstructed frame and the second frame; and

logic to encode the second frame to form encoded video information that includes at least

some of the difference information and is such that the second frame is reconstructable

Appl. No. 10/613,514
Amdt. dated December 2, 2003
Preliminary Amendment

PATENT

by a decoder from the encoded video information based on segmentation information generated by the decoder for the first reconstructed frame.

13. (New) The encoder of claim 12, wherein the logic to encode the first frame is configured to encode according to one or more still image compression technique.

14. (New) The encoder of claim 12 wherein the difference information generator is configured to encode a difference derived from an adaptive transform with respect to basis functions where the basis is determined by the segmentation of the first reconstructed frame.

15. (New) The encoder of claim 12, wherein the difference information generator is configured to encode a difference based upon kinetic information.

16. (New) The encoder of claim 12, further comprising a transmitter configured to transmit the video information to one or more of a decoder and a storage unit.

17. (New) The encoder of claim 12, further comprising difference logic within the logic to encode the second frame, wherein the difference logic uses a difference between the first frame and the first reconstructed frame and a difference between the segmentation of the first reconstructed frame and a segmentation of the second frame.

18. (New) A decoder for decoding video information, wherein the video information comprises at least a plurality of frames wherein each frame codes for an image of the video information, the decoder comprising:

an input to receive the first encoded frame and the second encoded frame;

logic to decode the first encoded frame to form a first reconstructed frame;

a segmenter that generates a segmentation of at least the first reconstructed frame; and

logic to decode the second encoded frame to form a second reconstructed frame using the

segmentation generated by the segmenter of the decoder and difference information encoded in the second encoded frame.

Appl. No. 10/613,514
Amdt. dated December 2, 2003
Preliminary Amendment

PATENT

19. (New) The decoder of claim 18, wherein the difference information is information derived from an adaptive transform with respect to basis functions where the choice of the basis depends on the segmentation.

20. (New) The decoder of claim 18, wherein the difference information is information based on kinetic information.

21. (New) The decoder of claim 18, wherein the logic to decode the second encoded frame is configured to decode according to one or more still image compression techniques.

22. (New) A method of encoding video information, wherein the video information comprises at least a plurality of frames wherein each frame codes for an image of the video information, the method comprising:

obtaining video information including at least a first frame of the plurality of frames;

encoding the first frame to form a first encoded frame;

determining a first reconstructed frame, wherein the first reconstructed frame is a frame that would result from a decoding of the first encoded frame;

obtaining segmentation information about the first reconstructed frame, wherein the segmentation information relates to segmenting the image of the first reconstructed frame based on image content of the first reconstructed frame;

obtaining a second frame of the plurality of frames;

computing difference information for the first and second frames, wherein the difference information relates segments of the first reconstructed frame and the second frame; and

generating encoded video information that includes at least some of the difference information and is such that the second frame is reconstructable by a decoder from the encoded video information based on segmentation information generated by the decoder for the first reconstructed frame.

Appl. No. 10/613,514
Amdt. dated December 2, 2003
Preliminary Amendment

PATENT

23. (New) The method of claim 22, wherein the encoded video information includes at least one keyframe, wherein a keyframe is a frame encoded without requiring reference to another frame of the plurality of frames.

24. (New) The method of claim 22, wherein the step of generating the encoded video information includes a step of adaptively coding image contents of frames adapting to location of the coded image contents relative to segment boundaries determined in the step of obtaining segmentation information.

25. (New) The method of claim 22, wherein computing difference information comprises predicting difference information from the difference information of previous frames.

26. (New) The method of claim 25, further comprising encoding the difference between the predicted difference information and actual difference information when generating the encoded video information.

27. (New) The method of claim 22, further comprising:
determining residue information corresponding to segmentation information; and
using the residue information in generating the encoded video information.

28. (New) A method of decoding video information, wherein the video information comprises at least a plurality of frames wherein each frame codes for an image of the video information, the plurality of frames including at least one frame designated as a keyframe, the method comprising:
obtaining an encoded keyframe;
reconstructing a keyframe from the encoded keyframe;
computing segmentation information about the keyframe from the reconstructed keyframe,
wherein the segmentation information relates to segmenting the image of the keyframe based on image content of the keyframe;
obtaining an encoded intermediate frame including difference information relating segments between the keyframe and the intermediate frame; and

Appl. No. 10/613,514
Amdt. dated December 2, 2003
Preliminary Amendment

PATENT

reconstructing an intermediate frame from the encoded intermediate frame using at least some of the difference information and at least some of the segmentation information.

29. (New) The method of claim 28, wherein the segments are other than regular polygons.

30. (New) The method of claim 28, wherein the encoded intermediate frame includes difference information represented by at least one of kinetic information and a series of basis functions.

31. (New) The method of claim 28, wherein the difference information includes a plurality of motion vectors.

32. (New) The method of claim 28, further comprising:

predicting the difference information;

obtaining a difference between the predicted difference information and the true difference information; and

using the difference between predicted and true difference information in reconstructing the intermediate frame.

33. (New) A signal embodied in a carrier wave, comprising:

an encoding of a first frame of video information, wherein the video information comprises at least a plurality of frames wherein each frame codes for an image of the video information; and

an encoding of a second frame of the video information, wherein the encoding of the second frame comprises difference information representing at least differences in position of segments of an image between the first frame and the second frame, wherein the segments of the image are determined by the image content and are segments that are determinable from a reconstruction of the first frame at a decoder.

Appl. No. 10/613,514
Amdt. dated December 2, 2003
Preliminary Amendment

PATENT

34. (New) The signal of claim 33, wherein the difference information is based upon at least one of an adaptive transformation of basis functions and kinetic information.

35. (New) A signal embodied in a carrier wave, comprising:

an encoding of a first frame of video information, wherein the video information comprises at least a plurality of frames wherein each frame codes for an image of the video information; and

an encoding of a second frame of the video information, wherein the encoding of the second frame comprises coefficients for a set of basis functions describing the image content of the second frame relative to the first frame and wherein the set of basis functions relates to segmentation.